UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,437	01/28/2004	Michael Joseph Reale	140069	3602

7590 11/10/2005

John S. Beulick
Armstrong Teasdale LLP
Suite 2600
One Metropolitan Square
St. Louis, MO 63102

EXAMINER	
KIM, TAE JUN	

ART UNIT	PAPER NUMBER
3746	

DATE MAILED: 11/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/766,437	REALE ET AL.	
	Examiner	Art Unit	
	Ted Kim	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/20/2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) *21-27* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *01/28/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 21-27 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 10/20/2005.

2. Applicant's election with traverse of the election of species in the reply filed on 10/20/2005 is acknowledged. The traversal is on the ground(s) that claims 21-27 read on the elected species. This is not found persuasive because applicant has made no argument as to how claims 21-27 read on the elected species of Figure 1. Instead, applicant has only argued that claim 1 reads on the species of Figure 1. Consequently, applicant's allegation of claims 21-27 reading on the elected species is unsupported and not persuasive.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 2, 7, 9-11, 15, 16, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nettel et al (2,372,846) in view of Erickson (6,412,291) or Zaugg (4,522,024). Nettel et al teach a cooling system for a gas turbine engine that includes at least a first compressor 1, a second compressor 9, and a turbine (col. 1, line 6), said cooling system comprising: an intercooler 7 coupled downstream from the first compressor 1 such that compressed air discharged from the first compressor is routed therethrough, said intercooler 7 having a working fluid flowing therethrough; and an injection system 4 (Fig. 1) coupled in flow communication with said intercooler 7, said injection system configured to channel condensate 13 into the second compressor at a predetermined rate to facilitate reducing an operating temperature of the gas turbine engine, the intercooler 7 further has a condensate drain valve 4. Nettel et al do not teach recirculating the condensate from 14 to the injection point 4. Erickson also teaches a gas turbine with an injection system 27 where the condensate from the cooler 11 is recirculated via pump 32 to the water injection system which reduces the demand for external water (col 2, lines 30-32, 38+). Zaugg teaches a cooling system for a gas turbine engine that includes at least a first compressor 3, a second compressor 3, and a turbine 1, said cooling system comprising: an intercooler 5 (left) coupled downstream from the first compressor such that compressed air discharged from the first compressor is routed therethrough, said intercooler having a working fluid flowing therethrough; and an injection system 16 coupled in flow communication with said intercooler 5, said injection system configured to channel condensate 10 formed in said intercooler into the

combustor 9; further comprising a condensate holding tank 11 in flow communication with said intercooler, said condensate holding tank configured to receive said condensate formed in said intercooler; further comprising a first pump 12 coupled in flow communication with said condensate holding tank; said first pump directs said condensate to a second holding tank 13; further comprising a second pump 15, different than said first pump, in flow communication with said second holding tank, said second pump configured to channel condensate from said second holding tank to said condensate injection system 9. It would have been obvious to one of ordinary skill in the art to source the water for injection 4 from the condensate and/or to use the pumping and water storage system of Zaugg to recirculate the water and reduce the demand for external water.

5. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zaugg (4,522,024) in view of either Anderson (5,66,9217) and/or Payling (6,467,252) and optionally Tsukamoto et al (6,397,578). Zaugg teaches a cooling system for a gas turbine engine that includes at least a first compressor 3, a second compressor 3, and a turbine 1, said cooling system comprising: an intercooler 5 (left) coupled downstream from the first compressor such that compressed air discharged from the first compressor is routed therethrough, said intercooler having a working fluid flowing therethrough; and an injection system 16 coupled in flow communication with said intercooler 5, said injection system configured to channel condensate 10 formed in said intercooler into the combustor 9; further comprising a condensate holding tank 11 in flow communication

with said intercooler, said condensate holding tank configured to receive said condensate formed in said intercooler; further comprising a first pump 12 coupled in flow communication with said condensate holding tank; said first pump directs said condensate to a second holding tank 13; further comprising a second pump 15, different than said first pump, in flow communication with said second holding tank, said second pump configured to channel condensate from said second holding tank to said condensate injection system 9. Zaugg does not teach injecting the water from the condensate into an injection system circumferentially spaced at the inlet of the second compressor nor the use of a demineralizer. Anderson teaches injecting condensate from pumps 22, 24 into both a circumferential array of nozzles 21 upstream of the second compressor 6 and downstream of the first compressor 5 as well as injecting the water 25 into the combustor, where the water injection between compressor stages cools the air (col. 2, lines 26+) which serves to reduce compressor power and increase the overall power from the turbine (col. 6, lines 1-4). Payling et al teach using an intercooler 68 between compressor stages 52, 54 and using injected water 64 via circumferentially spaced injectors between the first 52 and second 54 compressors where the water injection serves to cool the compressor air, reduce compressor horsepower used and increase engine output levels (col 2, lines 40-57). The demineralized water (col. 10, lines 16+) is pumped to the water injection system. It would have been obvious to one of ordinary skill in the art to inject the water between the compressor stages, as taught by Anderson and/or Payling, in order to cool the compressor air, to reduce compressor power and increase the overall power from the

turbine/output levels. As for the demineralizer, Tsukamoto et al teach using a demineralizer 16 upstream of the pump 17 for the condensate from 15 which is recirculated back into the gas turbine. It would have been obvious to one of ordinary skill in the art to employ a demineralizer before the pump 12 of Zaugg, in order to purify the water and reduce corrosion and/or fouling of the water injectors.

6. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Payling et al (6,467,252) in view of Zaugg (4,522,024) and optionally Tsukamoto et al (6,397,578). Payling et al teach a cooling system for a gas turbine engine that includes at least a first compressor 52, a second compressor 54, and a turbine 58, said cooling system comprising: an intercooler 68 coupled downstream from the first compressor such that compressed air discharged from the first compressor is routed therethrough, said intercooler having a working fluid flowing therethrough; and an injection system 64, said injection system configured to channel water into the second compressor 54 at a predetermined rate to facilitate reducing an operating temperature of the gas turbine engine; a second pump 352 for pumping demineralized water (col. 10, lines 16+) to the injection system. Payling et al do not teach using the water condensed from the intercooler for the water that is injected into the second compressor. Zaugg teaches a cooling system for a gas turbine engine that includes at least a first compressor 3, a second compressor 3, and a turbine 1, said cooling system comprising: an intercooler 5 (left) coupled downstream from the first compressor such that compressed air discharged from the first compressor is routed therethrough, said intercooler having a working fluid

flowing therethrough; and an injection system 16 coupled in flow communication with said intercooler 5, said injection system configured to channel condensate 10 formed in said intercooler into the combustor 9; further comprising a condensate holding tank 11 in flow communication with said intercooler, said condensate holding tank configured to receive said condensate formed in said intercooler; further comprising a first pump 12 coupled in flow communication with said condensate holding tank; said first pump directs said condensate to a second holding tank 13; further comprising a second pump 15, different than said first pump, in flow communication with said second holding tank, said second pump configured to channel condensate from said second holding tank to said condensate injection system 9. Zaugg clearly teaches that the water is condensed into the intercooler 5 and the condensate is conveniently recirculated back into the gas turbine system, which reduces the demand for external water (col. 1, lines 64+) and enhances the thermodynamic efficiency. It would have been obvious to one of ordinary skill in the art to use the condensate from the intercooler of Payling et al, as taught by Zaugg, in order to reduce the demand for external water (col. 1, lines 64+) and enhance the overall thermodynamic efficiency. As for the demineralizer, Tsukamoto et al teach using a demineralizer 16 upstream of the pump 17 for the condensate from 15 which is recirculated back into the gas turbine. It would have been obvious to one of ordinary skill in the art to employ a demineralizer before the pump 12 of Zaugg, in order to purify the water and reduce corrosion and/or fouling of the water injectors.

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 571-273-8300 for Regular faxes and 571-273-8300 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at http://www.uspto.gov/main/patents.htm

Ted Kim	Telephone	571-272-4829
Primary Examiner	Fax (Regular)	571-273-8300
November 9, 2005	Fax (After Final)	571-273-8300
Technology Center 3700 Receptionist	Telephone	703-308-0861
Patents Assistance Center	Telephone	800-786-9199